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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,131	10/28/2003	Kang-Bok Lee	3364P100	5527

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EXAMINER	
AGA, SORI A	

ART UNIT	PAPER NUMBER
2419	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/696,131	LEE ET AL.	
	Examiner	Art Unit	
	SORI A. AGA	2419	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 October 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2 and 4-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2 and 4-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/22/2008 has been entered.

Claim Rejections - 35 USC § 103

2. Claims 1 and 4-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's Admitted Prior Art (herein after APA) in view of Kalman et al. (US 6,680,912) (herein after Kalman) and Kao et al. (US 7,212,490) (herein after Kao) and Tang (US 6,195,332) (herein after Tang).

> **Regarding claim 1**, APA teaches a ring selection method for node-to-node packet transmission in a dual ring network including a plurality of transmission nodes and reception nodes, said method comprising: (a) transmitting a reception node address request message for packet transmission to all the nodes, and updating a routing table using information on a short path transferred from the reception node **[see figure 4 item 'S401' and page 4 lines 13-16 where an ARP request message is broadcast to all**

nodes. See also 'page 4 line 22-page5 line 1' where the routing table is updated using information received that indicates the ring having the least hop number];

(b) using information on inter-node hop numbers included in the routing table to select a ring having the lowest hop number between the reception nodes **[see page 4 lines 17-20 where the ring having the least hop number with the reference to the topology map according the ARP request message is selected. See also item 'S402' in figure 4]**;

However, APA does not teach (c) determining whether or not the selected ring is wrapped and (d) if the selected ring is suitable for packet transmission using the selected ring for packet transmission. However, Kalman in the same field of endeavor teaches when (if) all spans of a selected ring are operational and un-degraded (neither ring is wrapped), data flows on the ring with lowest cost path (using the ring for transmission) **[see column 3 lines 1-3]**. It would have been obvious for a person having ordinary skill in the art to determine whether the selected ring is wrapped and if the selected ring is suitable for packet transmission, using the selected ring for packet transmission. This is desirable because send the packet through a wrapped ring will only extend the path a packet will have to travel to arrive to the destination node which adds unnecessary redundant transmission. Avoiding such redundancy increases system efficiency.

However, APA does not explicitly teach comparing the selected ring's hope number with reference values based on a ring selection algorithm, However, Kao teaches comparing the ring selected based on shortest path (fewest hops) selection with ring selected using dynamic ring selection based on latency matrices indicative of congestion (reference

values based on a ring selection algorithm) **[column 3 lines 53-54; column 3 lines 57-60; and column 3 lines 17-20]**. Therefore, it would have been obvious at the time of the invention to compare usage rate and hop number with reference values of the ring selected with the dynamic ring selection in order to avoid creating more congestion by selecting a ring with an already high congestion.

However, APA does not explicitly teach comparing the selected ring's usage rate, <u>wherein said usage rate is an allowable transmission rate per node according to a fairness algorithm</u>. However, Tang teaches using a formula (algorithm) to determine a maximum allowable transmission rate at a node and then using the outcome to fairly multiplex data according to the fractional value **[see column 9 line 65-column 10 line 13]**. It would have been obvious for a person having ordinary skill in the art to include a usage rate where in the user rate is an allowable transmission rate per node according to a fairness algorithm. It is desirable to have an algorithm to determine usage rate because efficient load balancing can be achieved. Effective load balancing minimizes transmission bottlenecks which in turn increases system efficiency.

However, APA does not explicitly teach i) calculating a transmission coefficient using the hop number and delay time based on a path between the reception nodes, and the inter-node usage rate. However, Kalman teaches calculating a transmission coefficient using the hop number based on a path between the reception nodes, and the inter-node usage rate **[see column 7 line 66- column 8 line 5 where computing (calculating) cost (transmission coefficient) for direction 0 and direction 1 (each ring) based on various factors including hop count is shown]**. It would have been obvious for a person

having ordinary skill in the art to calculate a transmission coefficient using the hop number and the inter-node usage rate in order to identify the optimum routing of source traffic to the destination node (see column 3 line 16).

However, Kao in the same field of endeavor teaches using a latency metric (delay time) for a given node for each ring to determine a preferred path **[see Column 9 lines 46-52 and column 3 lines 12-13]**. Therefore, It would have been obvious at the time of the invention to include latency (delay time) in the cost computation of Kalman in order to meet quality of service guarantees (column 2 lines 22-27).

However, APA does not in the same embodiment teach (ii) storing the calculated transmission coefficient in the routing table. However, APA teaches storing routing information in a routing table as discussed above in 'a'. It would have been obvious at the time of the invention to add the calculated transmission coefficient in the routing table in order to facilitate the ring selection.

However, APA does not explicitly teach (iii) selecting a ring having the lowest transmission coefficient stored in the routing table as the reference value. However, Kalman in the same field of endeavor teaches selecting a preferred direction (ring) with the lowest cost (transmission coefficient) for transmitting **[column 7 lines 51-53].** It would have been obvious for a person having ordinary skill in the art to select the ring having the lowest transmission coefficient to send packets through the more efficient ring which in turn increases the efficiency of the communication system as a whole.

Regarding claim 4, APA in view of Kao, Kalman and Tang teaches the ring selection method as claimed in claim 1 as discussed above. However, APA does not teach the comparing with the reference values in (c) comprises: determining whether or not the selected ring from said using and the ring selected by the ring selection algorithm have the same reference values. However, Kao teaches using direction references (comparing reference values) **[column 10 lines 56-57 - see also fig. 5]**. Kao also teaches comparing the two selected rings as discussed above regarding claim 8. Therefore, it would have been obvious at the time of the invention to compare the reference values in order to determine the path with the shortest path while avoiding overloading the same path.

Regarding claim 5, APA in view of Kao, Kalman and Tang teaches the ring selection method as claimed in claim 1. However, APA does not teach the transmission coefficient is determined with reference to the hop number between the transmission node and the reception node, the usage rate of each node, and the inter-node delay time. However, Kalman teaches calculating a transmission coefficient using the hop number based on a path between the reception nodes, and the inter-node usage rate **[see column 7 line 66-column 8 line 5 where computing (calculating) cost (transmission coefficient) for direction 0 and direction 1 (each ring) based on various factors including hop count is shown]**. It would have been obvious for a person having ordinary skill in the art to calculate a transmission coefficient using the hop number between the transmission node and the reception node in order to identify the optimum routing of source traffic to the destination node (see column 3 line 16).

However, Kao in the same field of endeavor teaches using a latency metric (delay time) for a given node for each ring to determine a preferred path **[see Column 9 lines 46-52 and column 3 lines 12-13]**. Therefore, It would have been obvious at the time of the invention to include latency (delay time) in the transmission coefficient computation in order to meet quality of service guarantees (column 2 lines 22-27).

However, Tang teaches using a formula (algorithm) to determine a maximum allowable transmission rate (usage rate) at a node and then using the outcome to fairly multiplex data according to the fractional value **[see column 9 line 65-column 10 line 13]**. It would have been obvious for a person having ordinary skill in the art to include a usage rate in determining the transmission coefficient. It is desirable to have an algorithm to determine usage rate because efficient load balancing can be achieved. Effective load balancing minimizes transmission bottlenecks which in turn increases system efficiency.

Regarding claim 6, APA in view of Kao, Kalman and Tang teaches the ring selection method as claimed in claim 1 as discussed above. However, APA does not explicitly teach the usage rate and the transmission coefficient are calculated in a predetermined cycle, and updated in the routing table. However, Kao in the same field of endeavor teaches calculating and updating latency metric (transmission coefficient) periodically **[column 10 lines 40-41 and column 5 line 23 - see also fig.5].** Therefore, it would have been obvious at the time of the invention to calculate usage rate and transmission coefficient periodically and update routing table accordingly in order to have timely

information available in making the most efficient routing decisions in the ring selection process.

Regarding claim 7, APA in view of Kao, Kalman and Tang teaches the ring selection method as claimed in claim 1 as discussed above. However, APA does not explicitly teach : selecting the other ring when the selected ring is wrapped. However, Kalman teaches when a link failure is detected (wrapped path) the other ring is selected **[column 3 lines 26-28]**. IT would have been obvious for a person having ordinary skill in the art to select the other ring when the selected ring is wrapped. This is desirable because sending the packet through a wrapped ring will only extend the path a packet will have to travel to arrive to the destination node which adds unnecessary redundant transmission. Avoiding such redundancy increases system efficiency.

3. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over APA, Kao, Kalman and Tang as applied to claims 1 and 4-7 above, and further in view of Cisco IOS release (herein after Cisco).

Regarding claim 2, APA in view of Kao, Kalman and Tang teaches the ring selection method as claimed in claim 1. However, APA does not teach claim 1 wherein in (a), each of the transmission and reception nodes have a topology map including information on inter-node hop numbers, port information, MAC address, and wrapped-or-not information. However, Kao in the same field of endeavor teaches hop count is included in

each topology table of each node **[see column 10 line 22-29].** Kao also teaches shortest path determination is made based on this table **[see column 9 line 47]**. Therefore, it would have been obvious at the time of the invention to determine hop count and said usage rate based on data stored in a routing table in each node in order to have quick access to the information needed to make said ring selection.

However, Cisco in the same field of endeavor teaches maintaining a topology map of the ring at every node including, MAC addresses, hop counts and wrapped or not information [pages 5 and 6]. Therefore, it would have been obvious at the time of the invention to make Kalman's table include information on MAC address, wrapped or not information and inter-node hop numbers in order to make information available for the system in making the ring selection process and making routing decisions.

4. Claims 8,9 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kalman et al. in view of Tang and Kao et al. as applied to claims 1 and 4-7 above.

Regarding claim 8, Kalman teaches a method for selecting a ring for transmitting packets in a dual ring network comprising: if neither ring is wrapped: (a) calculating a transmission coefficient for each ring based on for each node in each ring, a hop number **[see column 3 lines 1-3 and column 7 line 66-column 8 line 5 where Kalman teaches when (if) all spans operational and un-degraded (neither ring is wrapped), data flows on the ring with lowest cost path (a) computing (calculating) cost**

(transmission coefficient) for direction 0 and direction 1 (each ring) based on various factors including hop count];

(b) selecting the ring with the lowest calculated transmission coefficient for transmitting **[see column 7 lines 51-53 selecting a preferred direction (ring) with the lowest cost (transmission coefficient) for transmitting].**

However, Kalman does not teach delay time. However, However, Kao in the same field of endeavor teaches using a latency metric (delay time) for a given node for each ring to determine a preferred path **[see Column 9 lines 46-52 and column 3 lines 12-13]**. Therefore, It would have been obvious at the time of the invention to include latency (delay time) in the cost computation of Kalman in order to meet quality of service guarantees (column 2 lines 22-27).

However, Kalman does not teach using a usage rate, <u>wherein said usage rate is an allowable transmission rate per node according to a fairness algorithm.</u> However, Tang teaches using a formula (algorithm) to determine a maximum allowable transmission rate at a node and then using the outcome to fairly multiplex data according to the fractional value **[see column 9 line 65-column 10 line 13]**. It would have been obvious for a person having ordinary skill in the art to include a usage rate where in the user rate is an allowable transmission rate per node according to a fairness algorithm. It is desirable to have an algorithm to determine usage rate because efficient load balancing can be achieved. Effective load balancing minimizes transmission bottlenecks which in turn increases system efficiency.

Regarding claim 9, Kalman in view of Kao and Tang teaches the method defined by claim 8 as discussed above. However, Kalman does not explicitly teach hop number and said usage rate are determined with reference to values in a routing table. However, Kao in the same field of endeavor teaches hop count is included in each table of each node **[column 10 line 22-29].** Kao also teaches shortest path determination is made based on this table **[column 9 line 47]**. Therefore, it would have been obvious at the time of the invention to determine hop count and said usage rate based on data stored in a routing table in each node in order to have quick access to the information needed to make said ring selection.

Regarding claim 11, Kalman teaches the method defined by claim 8, wherein said selecting comprises: calculating a transmission coefficient for each of the nodes **[see column 3 line 7 where Kalman teaches each node determines (calculates) lowest cost path (transmission coefficient) for each of the nodes]**, storing the calculated transmission coefficient in a routing table **[see colum8 line 46-47 where Kalman teaches updating (storing) the calculated transmission coefficient in a preferred direction table – see table 1 (routing table)],** and selecting a ring having a lowest transmission coefficient stored in the routing table **[see column 7 lines 51-53 selecting a preferred direction (ring) with the lowest cost (transmission coefficient) for transmitting].**

Regarding claim 12, Kalman in view of Kao and Tang teaches the method defined by

claim 8 as discussed above. However, Kalman does not explicitly teach the usage rate and the transmission coefficient are calculated in a predetermined cycle, and updated in the routing table. However, Kao in the same field of endeavor teaches calculating and updating latency metric (transmission coefficient) periodically **[see column 10 lines 40-41 and column 5 line 23 - see also fig.5]**. Therefore, it would have been obvious at the time of the invention to calculate usage rate and transmission coefficient periodically and update routing table accordingly in order to have timely information available in making the most efficient routing decisions in the ring selection process.

5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kalman, Kao and Tang as applied to claims 8,9 and 11-12 above, and further in view of Cisco IOS Release as applied to claim 2 above.

Regarding claim 10, Kalman in view of Kao and Tang teaches the method defined by claim 8 as discussed above. Kalman also teaches each of the nodes has a topology map **[see column 14 lines 63-65 where all nodes independently store current topology of the ring (topology map)]** including information on port information **[column 7 line 65 and column 12 lines 52-53 – see also figure 6; where Kalman also teaches a preferred direction is included with in table 1 (topology table). The preferred direction entry (0 or 1) is considered to be port information because each node is connected to adjacent nodes by ring interface cards (ports) and each node (interface card) corresponds to each direction (0 or 1)]**.

However, Kalman does not explicitly teach inter-node hop numbers and MAC address. However, Kao, in the same field of endeavor teaches a topology table including MAC addresses and hop count [column 10 line 22-29 - see also figure 5]. It would have been obvious for a person having ordinary skill in the art to include MAC address and hop numbers in the topology map (routing table) in Kalman in order to have a systematic information supply available for the ring selection process which increases the efficiency of the ring selection system.

However Kalman does not explicitly teach the topology map has wrapped-or-not information. However, Cisco in the same field of endeavor teaches maintaining a topology map of the ring at every node including, MAC addresses, hop counts and wrapped or not information **[tables in pages 5 and 6]**. Therefore, it would have been obvious at the time of the invention to make Kalman's table include wrapped or not information in order to have a systematic information supply available for the ring selection process which increases the efficiency of the ring selection system.

Response to Arguments

6. Applicant's arguments with respect to claims 1,2 and 4-12 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SORI A. AGA whose telephone number is (571)270-1868. The examiner can normally be reached on M-F 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edan Orgad can be reached on (571)272-7884. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. A. A./
Examiner, Art Unit 2419

/Edan Orgad/
Supervisory Patent Examiner, Art Unit 2419